

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



25 APR 2005



(43) International Publication Date
13 May 2004 (13.05.2004)

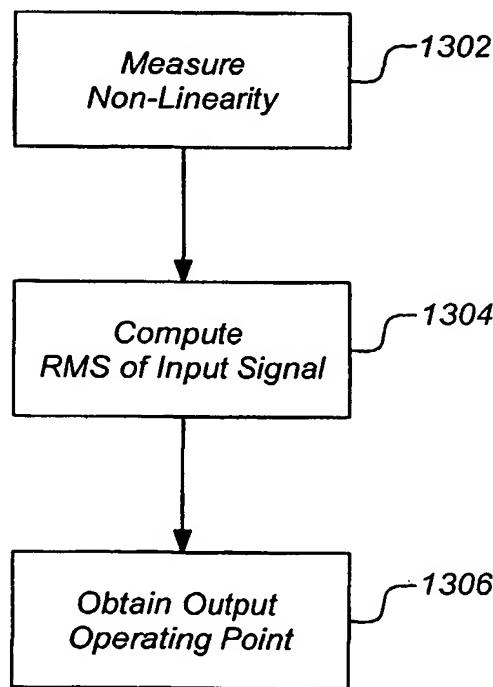
PCT

(10) International Publication Number
WO 2004/040406 A2

(51) International Patent Classification⁷: G06F (72) Inventors; and
 (21) International Application Number: PCT/US2003/033130 (75) Inventors/Applicants (for US only): CHEN, Ernest, C. [US/US]; 1025 Via Cordova, San Pedro, CA 90732 (US).
 (22) International Filing Date: 17 October 2003 (17.10.2003) MAITRA, Shamik [US/US]; 1911 Camino de la Costa, #413, Redondo Beach, CA 90277 (US).
 (25) Filing Language: English (74) Agent: CROOK, John, A.; Hughes Electronics Corporation, Patent Docket Department, RE/R11/A109, P.O. Box 956, El Segundo, CA 90245-0956 (US).
 (26) Publication Language: English (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
 (30) Priority Data:
 60/421,289 25 October 2002 (25.10.2002) US (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
 60/510,368 10 October 2003 (10.10.2003) US
 (63) Related by continuation (CON) or continuation-in-part (CIP) to earlier applications:
 US 09/844,401 (CIP)
 Filed on 27 April 2001 (27.04.2001)
 US 10/165,710 (CIP)
 Filed on 7 June 2002 (07.06.2002)
 (71) Applicant (for all designated States except US): THE DIRECTV GROUP, INC. [US/US]; 2250 E. Imperial Highway, El Segundo, CA 90245 (US).

[Continued on next page]

(54) Title: ESTIMATING THE OPERATING POINT ON A NONLINEAR TRAVELING WAVE TUBE AMPLIFIER



(57) **Abstract:** A method, apparatus, article of manufacture, and a memory structure provide the ability to determine an input operating point and an output operating point on a non-linear traveling wave tube amplifier (TWTA). The non-linearity of the TWTA is measured. An input roots mean-square (RMS) value of an input signal used to measure the non-linearity of the TWTA is computed. The RMS value identifies an input operating point of the measured non-linearity of the TWTA. Lastly, an output operating point is obtained.